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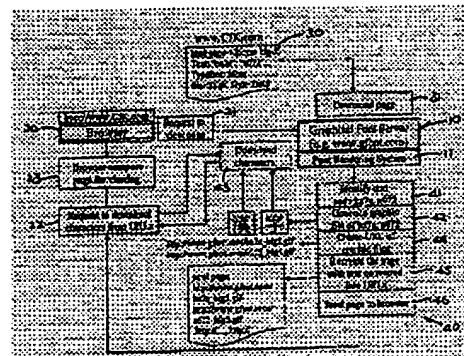
[54] INTERNET-BASED FONT SERVER 以互聯網為基礎的字體服務器

[57] An Internet-based font server (10) for access by an Internet browser (20) to provide the browser (20) with representations of text elements, such as ideographic characters, in one of a plurality of languages for browsing a web page (30) in that language over the Internet. The server (10) comprises an associated website for access by the browser (20), a database of ideographic character fonts of different sizes and styles, first means (31) for downloading the web page (30) to the server (10), and a parser program (40). The parser program (40) is arranged to identify text codes of the ideographic characters in the web page (30) and replace the identified text codes with respective URL (Uniform Resource Locator) addresses, thereby converting the text of the web page (30) into said URL addresses. The server (10) includes second means (46) for returning the converted web page to the browser (20).

一種以互聯網為基礎的字體服務器(10)，用互聯網瀏覽器(20)進行存取，以便向瀏覽器(20)提供對正文單元的顯示，例如對多種語言中一種語言的獨特字符的顯示，以瀏覽互聯網上該種語言的網文頁(30)。服務器(10)包括：一個供瀏覽器(20)存取的相關網位、一個不同尺寸和式樣的獨特字符字體的數據庫、一個供將網文頁(30)下載到服務器(10)的第一裝置(31)、以及一個語法分析程序(40)。語法分析程序(40)設置成能識別網文頁(30)中獨特字符的正文碼，並用各 URL(均衡資源定位器)地址取代識別出的正文碼，從而將網文頁(30)上的正文轉換成上述 URL 地址。該服務器(10)還包括一個第二裝置(46)，用於將轉換過的網文頁送回瀏覽器(20)。

INTERNET-BASED FONT SERVER

The present invention relates to an Internet-based font server for browsing web pages in global languages, particularly but not exclusively languages of ideographic nature, such as Chinese, Japanese and Korean characters (collectively known as CJK characters).

BACKGROUND OF THE INVENTION

In general, in order to be able to display texts in a particular language such as CJK characters, the operating system of a computer usually incorporates a font rendering system, such as TrueType in Microsoft Windows, which utilises font files resident in the local hard disk. The font files must be compatible with the particular font rendering system, which generates a bitmap of a character from the font files for use by the operating system and application software. One such application is using an Internet browser to access web information. The browser makes use of the font rendering system in the operating system to generate a bitmap of the text information for display on screen. Although the font rendering system supports different sizes and styles of the characters as specified by the web pages, different font files are required for the font rendering system to work in different languages.

The advent of the Internet and related technologies has prompted the growth of a new generation of devices generally known as web or information appliances using the Internet for the communication of multimedia

5 information, which are typically equipped with only limited computing power and small memory just sufficient to run a micro version of a standard Internet browser. Examples of such devices are Wireless Application Protocol or WAP based mobile phones, set-top boxes and

10 screen phones. Due to their limited capacity, only a rather basic font rendering system can be implemented to support one style of fonts of one or two sizes at most, particularly for the viewing and input of CJK characters.

15 The invention seeks to mitigate or at least alleviate such problems by providing an Internet-based font server.

SUMMARY OF THE INVENTION

20 According to the invention, there is provided an Internet-based font server for access by an Internet browser to provide a said browser with representations of text elements in one of a plurality of languages for browsing a web page in that language over the Internet, which server

25 comprises an associated website for access by a said browser, a database of text element fonts of different sizes and styles, first means for downloading a said web page to the server, a parser program for identifying text

codes of the text elements in a said web page and replacing the identified text codes with respective URL (Uniform Resource Locator) addresses, thereby converting the text of a said web page into said URL addresses, and

5   second means for returning the converted web page to a said browser.

Preferably, the parser program is arranged to generate respective font files for the identified text codes and

10 create said URL addresses for the respective font files to replace the identified text codes with the URL addresses.

Preferably, said second means is arranged to return the

15 converted web page to a said browser by downloading successively the font files via the respective URL addresses.

It is preferred that the server is arranged to pack the

20 font files into a single data packet for said second means to return the converted web page to a said browser.

It is preferred that the server is arranged to match the font characteristics as specified in a said web page to

25 produce a closest match of the intended font appearance for said second means to return the converted web page to a said browser.

-4-

In a preferred embodiment, the text elements are ideographic characters.

More preferably, the server includes a database associated
5   with a standard ideographic character input method and is arranged to match a received keystroke pattern of a character according to the input method with the corresponding pattern in the input method database to identify the character and then create a unique URL
10 address for that character, by means of the parser program, for subsequent download to a said browser.

It is preferred that the URL addresses are determined according to an encoding scheme, in which each URL
15 address comprises the address of the website, the text code for the respective text element and a national code for the relevant font.

BRIEF DESCRIPTION OF DRAWINGS

20

The invention will now be more particularly described, by way of example only, with reference to the accompanying drawings, in which:

25 Figure 1 is a flow chart illustrating the operation of an embodiment of an Internet-based font server in accordance with the invention with an Internet browser in a system that does not incorporate a local cache manager; and

Figure 2 is a flow chart illustrating the operation of the font server of Figure 1 with an Internet browser in a system that incorporates a local cache manager.

5

DETAILED DESCRIPTION OF PREFERRED EMBODIMENT

Referring initially to Figure 1 of the drawings, there is shown an Internet-based font server 10 embodying the

10   invention, which server 10 incorporates a database of character fonts of different languages, such as Chinese, Japanese and Korean or CJK character fonts, and different sizes and styles, and a font rendering system 11. The server 10 has an associated website, which may be called

15   www.gfont.com, for access as an interface upon request by any standard Internet browser 20 in a TCP/IP based network to provide the browser 20 with graphical representations of CJK characters for browsing a specific web page 30 coded in HTML, WML and/or XML formats. The

20   web page 30 may be called www.CJK.com and may include a big5 Chinese text beginning with character or text codes "ba7e", "a672" ... , of typeface Ming, size 16 pt and style bold.

25   The font server 10 responds to a request issued by the browser 20 for viewing and input of CJK characters (step 21) over the web page 30. In operation, the web page 30 is first downloaded to the font server 10 (step 31). A

-6-

parser program 40 of the font rendering system 11 will then be invoked to identify the text codes "ba7e", "a672" ... of all the CJK characters in the web page 30 (step 41), generating respective character font graphic files

5   for the identified text codes (step 42) in the server 10 ready for download (step 43), and replace the text codes with respective URL (Uniform Resource Locator) addresses corresponding to the graphical representations of the CJK characters in GIF format, by creating the URL addresses

10 for the respective graphic files (step 44). The web page 30 is thus converted with its text into the aforesaid URL addresses (step 45), and the converted web page will subsequently be returned to the browser 20 (step 46).

15 The text code of each CJK character is uniquely preserved in the corresponding URL address which identifies the national coding scheme or Unicode font. The font rendering system 11 serves to produce a bitmap of the required size and style of each character font and

20 convert the bitmap into GIF, BMP or any other browser-supported graphic format for generating a corresponding graphic file with a unique URL address.

The browser 20 responds by requesting to download

25 successively the graphic files of the corresponding CJK characters from the server 10 via the respective URL addresses (step 22) for page composition (step 23) and subsequent display and viewing on the screen. The font

server 10 will try to match the font characteristics, such as size and style, as specified in the web page 30 and produce a closest match of the intended character appearance in graphic format for downloading.

5

Reference is now made to Figure 2 of the drawings, which illustrates the use of the font server 10 by the browser 20 in a system which incorporates a local proxy server or cache manager 50. The operation of the server 10 and the browser 20 follows closely as that described above in relation to Figure 1, with equivalent components and steps designated by the same reference numerals. In order to shorten the download time on the Internet, the server 10 packs the requested character graphic files into a single data file or packet (step 51) for subsequent downloading to the browser 20 (step 43). Based on proxy server technology as specified in Hyper Text Transfer Protocol (HTTP), the browser 20 requests to download, as a single packet or in a single transmission, all the graphic characters from the server 10 for each web page viewing session. This will minimise the handshaking steps as required by the use of the URL addresses for successively downloading each character.

25 The data packet will be processed by the local cache manager 50 for the following two purposes: first to extract each individual graphic character and generate a unique local URL address for an individual character

graphic file (step 52), and second to store the characters in the local cache (step 53) such that no future downloading of the same character will be required. More specifically, if a particular character is

5 not found in the local cache, a request is issued to download the missing character from the font server 10 (step 54). On the other hand, if that character is found in the local cache, it will be retrieved from the local cache for use (step 55), without being downloaded again

10 from the server 10. Accordingly, a local character font cache system may be built.

The font server 10 supports most standard CJK character input methods by including databases associated with such

15 input methods. In operation, the browser 20 sends a series of keystrokes of a character according to the input method to the server 10, which in turn matches the keystroke pattern with the corresponding pattern in the input method database to identify the corresponding

20 character. The server 10 will then create a unique URL address for that character, by means of the parser program (40) as described above, for subsequent download to the browser 20 and display on the screen.

25 It is envisaged that the subject font server may be set up to work on both character-based texts and/or letter-based texts, which are formed by characters and/or letters (making up words) as text elements. Examples of

letter-based texts are English, French, Hebrew and Hindi, for which the letters are to be downloaded via the corresponding URL addresses.

5 In the drawings, there are shown two examples of an URL address, which are "http://www.gfont.com/ba7e_big5.gif" and "http://www.gfont.com/a672_big5.gif" for big5 Chinese characters having respective text codes "ba7e" and "a672". The URL addresses are determined according to an

10 encoding scheme, in which each URL address is made up by three major components, namely (1) the server website address "www.gfont.com", (2) the text code "ba7e" or "a672" for the relevant character and (3) the national code for the relevant character font. For letter-based

15 texts, taking English as an example, the ASCII code of each letter is used as its text code. The encoded URL addresses are readily readable by any existing computing devices.

20 The subject invention provides an Internet-based font server, based on known Internet technologies, for downloading characters and/or letters or collectively text elements to browsers on demand, thereby avoiding the need for the browser systems to have the text element

25 fonts resident in local devices. The use of the font server effectively creates a global font platform for the Internet and offers an unlimited font and language support to browsers of diverse Internet connected

devices, such as personal computers, mobile phones, set-top boxes and screen phones, etc.

5   The invention has been given by way of example only, and various other modifications of and/or alterations to the described embodiment may be made by persons skilled in the art without departing from the scope of the invention as specified in the appended claims.

CLAIMS

1. An Internet-based font server for access by an Internet browser to provide a said browser with representations of text elements in one of a plurality of languages for browsing a web page in that language over the Internet, which server comprises an associated website for access by a said browser, a database of text element fonts of different sizes and styles, first means for downloading a said web page to the server, a parser program for identifying text codes of the text elements in a said web page and replacing the identified text codes with respective URL (Uniform Resource Locator) addresses, thereby converting the text of a said web page into said URL addresses, and second means for returning the converted web page to a said browser.

2. The Internet-based font server as claimed in claim 1, wherein the parser program is arranged to generate respective font files for the identified text codes and create said URL addresses for the respective font files to replace the identified text codes with the URL addresses.

3. The Internet-based font server as claimed in claim 1 or claim 2, wherein said second means is arranged to return the converted web page to a said browser by downloading successively the font files via the

respective URL addresses.

4.   The Internet-based font server as claimed in claim 2, wherein the server is arranged to pack the font files

5   into a single data packet for said second means to return the converted web page to a said browser.

5.   The Internet-based font server as claimed in any one of claims 1 to 4, wherein the server is arranged to match

10   the font characteristics as specified in a said web page to produce a closest match of the intended font appearance for said second means to return the converted web page to a said browser.

15   6.   The Internet-based font server as claimed in any one of claims 1 to 5, wherein the text elements are ideographic characters.

7.   The Internet-based font server as claimed in claim 6,

20   wherein the server includes a database associated with a standard ideographic character input method and is arranged to match a received keystroke pattern of a character according to the input method with the corresponding pattern in the input method database to

25   identify the character and then create a unique URL address for that character, by means of the parser program, for subsequent download to a said browser.

8. The Internet-based font server as claimed in any one of the preceding claims, wherein the URL addresses are determined according to an encoding scheme, in which each URL address comprises the address of the website, the

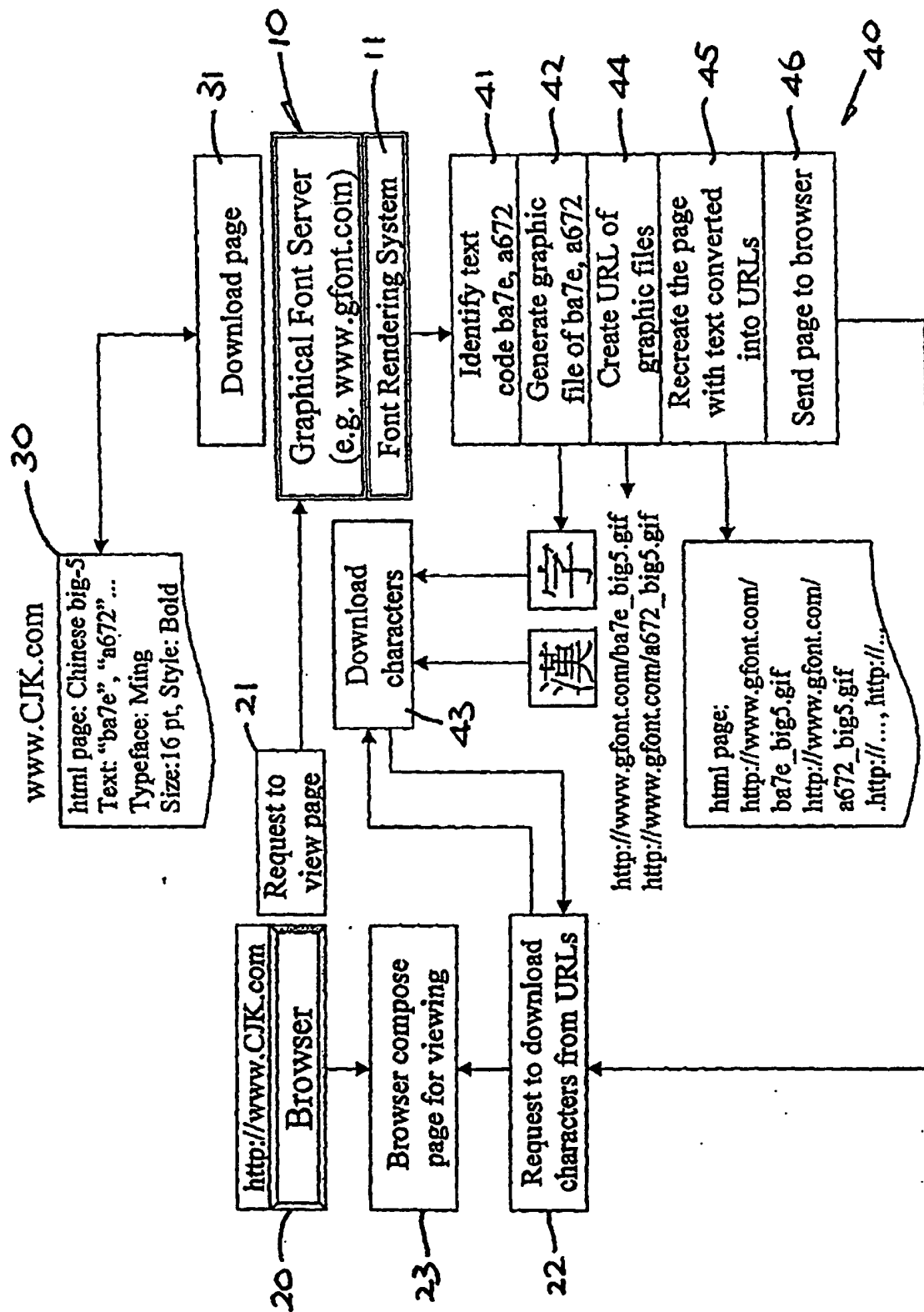5 text code for the respective text element and a national code for the relevant font.
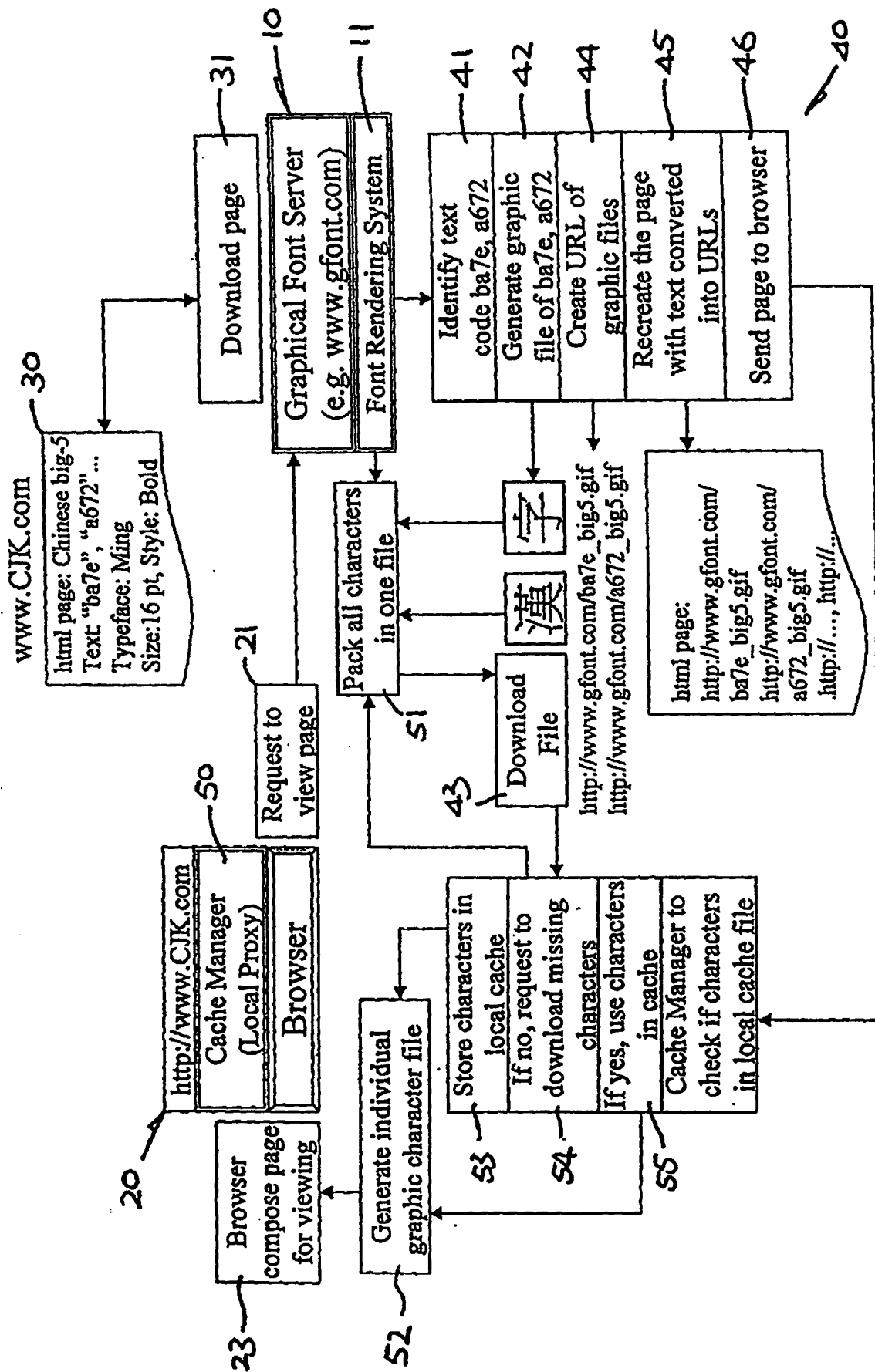
FIG. 1

www.CJK.com 30

Download page 31

Graphical Font Server
(e.g. www.gfont.com) 10

Font Rendering System 11

Identify text
code ba7e, a672 41

Generate graphic
file of ba7e, a672 42

Create URL of
graphic files 44

Recreate the page
with text converted
into URLs 45

Send page to browser 46

40

html page: Chinese big-5
Text "ba7e", "a672"...
Typeface: Ming
Size:16 pt, Style: Bold

Request to
view page 21

Pack all characters
in one file 51

Download
File 43

http://www.gfont.com/ba7e_big5.gif
http://www.gfont.com/a672_big5.gif

html page:
http://www.gfont.com/
ba7e_big5.gif
http://www.gfont.com/
a672_big5.gif
http://..., http://...

http://www.CJK.com 20

Cache Manager
(Local Proxy) 50

Browser

Store characters in
local cache
If no, request to
download missing
characters 53

If yes, use characters
in cache 54

Cache Manager to
check if characters
in local cache file 55

Browser
compose page
for viewing 23

Generate individual
graphic character file 52

FIG. 2